WHAT IS CLAIMED IS:

1. A highly efficient method for transducing stem cells with a vector particle containing a gene of interest, which method comprises contacting target stem cells with vector particles pseudotyped with feline endogenous virus RD114 envelope protein and containing a gene of interest, wherein the vector particles are substantially free of factors that induce stem cell differentiation.

2. The method of claim 1, wherein the vector particle is a retroviral vector particle comprising a modified retroviral genome containing the gene of interest.

3. The method of claim 2, wherein the retroviral vector particles are freed of factors that induce stem cell differentiation by being substantially free of producer cells and producer cell supernatant.

4. The method of claim 3, wherein the retroviral particles are pre-adsorbed onto a surface that promotes adherence of the retroviral particles.

5. The method of claim 4, wherein the surface is coated with an adherence promoting agent.

6. The method of claim 5, wherein the adherence promoting agent is retronectin.

7. The method of claim 2, wherein the retroviral particles are freed of producer cells and producer cell supernatant by ultracentrifugation.

8. The method of claim 2 wherein the retroviral particle is an oncoviral particle.

9. The method of claim 2 wherein the retroviral particle is a lentiviral particle.

10. The method of claim 1 wherein the target stem cells are pre-stimulated.

11. The method of claim 10, wherein the target stem cells are prestimulated by treatment with signaling molecules selected from the group consisting of cytokines, growth factors and phytohemagglutinin.

12. The method of claim 1 wherein the target stem cells are hematopoietic stem cells.

13. The method of claim 12 wherein the target hematopoietic stem cells are selected from the group consisting of cord blood cells, mobilized peripheral blood cells, bone marrow cells, and liver.

14. The method of claim 13, wherein the target hematopoietic stem cells are selected from the group consisting of $CD34^+$ cells and $CD34^+ CD38^-$ cells.

15. The method according to claim 2, wherein upon engraftment of the transduced stem cells contacted one time with the retroviral particles into a host, greater than 10% of the transduced cells express the gene of interest.

16. The method according to claim 15, wherein greater than about 40% of the transduced cells express the gene of interest.

17. A population of stem cells transduced with vector particles pseudotyped with feline endogenous virus RD114 envelope protein and containing a gene of interest, wherein the population of stem cells are substantially undifferentiated.

18. The population of stem cells of claim 17, wherein the vector particle is a retroviral particle comprising a modified retroviral genome containing the gene of interest.

19. The population of stem cells of claim 18, wherein upon engraftment of the stem cells into a host, the number of stem cells in the host that express the gene of interest is greater than 10% times a number of exposures of the stem cells to the retroviral vector particles.

20. The population of stem cells of claim 18, wherein the stem cells were transduced by a single exposure to the retroviral vector particles and upon engraftment of the stem cells into a host, greater than about 40% of the stem cells express the gene of interest.

21. A method for introducing a gene of interest into a host, which method comprises introducing the transduced stem cells of claim 17 into a host.

22. The method according to claim 21, wherein the host is a human and the stem cells are human stem cells.

23. The method according to claim 21, wherein the host is an immunodeficient animal and the stem cells are human stem cells.

24. The method according to claim 21, wherein upon engraftment of the transduced stem cells contacted one time with the retroviral particles into a host, greater than 10% of the transduced cells express the gene of interest.

25. The method according to claim 24, wherein greater than about 40% of the transduced stem cells express the gene of interest.

26. A method of treating a disease or disorder, which method comprises administering to a patient a therapeutically effective dose of the transduced stem cells of claim 17, wherein the gene of interest is a therapeutic gene.

27. The method of claim 26, wherein the disease or disorder is selected from the group consisting of hematopoietic disease, neural disease, joint-related disease, muscular disease, and liver disease.

28. A non-human animal engrafted with the stem cells of claim 17.

29. The non-human animal of claim 28, which is an immunodeficient mouse.

30. The non-human animal of claim 28, which is a monkey.

31. A kit comprising retroviral vector particles pseudotyped with feline endogenous virus RD114 envelope protein and containing a gene of interest their genome pre-adsorbed onto a surface that promotes adherence of the retroviral particles, wherein the retroviral vector particles are substantially free of producer cells and producer cell supernatant.

32. The kit of claim 31, wherein the surface is coated with an adherence promoting agent.

33. The kit of claim 32, wherein the adherence promoting agent is retronectin.

34. A method for preparing a kit comprising retroviral vector particles pseudotyped with feline endogenous virus RD114 envelope protein and containing a gene of interest their genome pre-adsorbed onto a surface that promotes adherence of the retroviral particles, wherein the retroviral vector particles are substantially free of producer cells and producer cell supernatant, which method comprises contacting the surface with the retroviral vector particles for a sufficient period of time to permit adherence of the retroviral particles to the surface, and removing supernatant in which the retroviral particles were suspended from the surface.

35. The method of claim 34, wherein the surface is coated with an adherence promoting agent.

36. The method of claim 35, wherein the adherence promoting agent is retronectin.

37. The method of claim 34, further comprising storing the retroviral particles adsorbed onto the surface at -70°C.